

# VMware vSphere 5 on Dell PowerEdge Systems Deployment Guide



# Notes, Cautions, and Warnings



**NOTE:** A NOTE indicates important information that helps you make better use of your computer.



**CAUTION:** A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.



**WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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# Introduction


This document helps you to deploy VMware ESXi 5 on Dell systems and provides specific information on recommended configurations, best practices, and additional resources.


 **NOTE:** VMware vSphere 5 includes the ESXi architecture only.

Dell offers the following VMware editions:

- vSphere Essentials Plus
- vSphere Standard
- vSphere Enterprise
- vSphere Enterprise Plus
- VMware vCenter Server

 **NOTE:** In addition to the above, Dell also offers ESXi Single Server edition. For information about different editions, see [vmware.com/products/vsphere/buy/editions\\_comparison.html](http://vmware.com/products/vsphere/buy/editions_comparison.html).

 **NOTE:** vSphere Essentials Plus is an all-inclusive package that includes licenses for three physical systems, each system with up to two processors. It also includes VMware vCenter Server to centrally manage the systems. vSphere Essentials Plus edition is supported only on two-socket systems.

 **NOTE:** With the release of vSphere v5.0, all Partner Activation Codes shipped with current systems is for vSphere 5 licensing. If you have a vSphere 5 subscription that is above Trial or Basic, you can downgrade to vSphere 4.1. To get your downgrade keys, register your Partner Activation Code and login to [vmware.com/accounts](http://vmware.com/accounts). Go to **Manage Product Licenses** → **vSphere v5.0** on the license administration portal.

## vSphere 5 Architecture Overview

vSphere infrastructure consists of the following components:

<b>ESXi</b>	Allows multiple operating systems to run simultaneously on a single system.
<b>vCenter Server</b>	Runs on Windows-based operating systems. It monitors and manages virtual machines and copies of ESXi. With vCenter Server, you can create, start, stop, and migrate virtual machines across the entire physical data center. vCenter Server is optional and is required for advanced management capabilities such as VMware VMotion, Distributed Resource Scheduling (DRS), and High Availability (HA). For more information, see the topic "Deploying vCenter Server".
<b>vCenter Server Database</b>	Stores all the configuration data about a VMware infrastructure environment. It is recommended that you use a production database such as Microsoft SQL Server or Oracle for the vCenter Server database.
<b>vSphere Client</b>	Required to manage an ESXi host by directly connecting to it or through vCenter Server. Installs on a system running a supported Windows operating system.
<b>Virtual Machine DataStore</b>	Stores virtual machine configuration and virtual disk files. The virtual machine storage can either be an internal storage local to the ESXi or an external storage that can be shared by multiple ESXi

systems. Advanced features such as VMotion, HA, and DRS require that the disk and configuration files are stored on the external shared storage of the virtual machines.

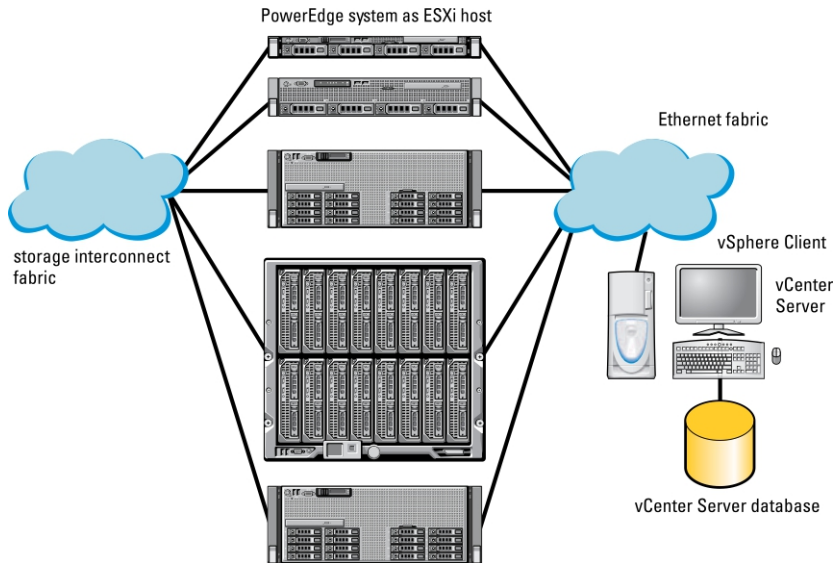


Figure 1. vSphere Components

## ESXi Architecture Overview

ESXi is a bare-metal enterprise class hypervisor, which can be pre-installed on Dell PowerEdge systems. With the reduced footprint of the hypervisor, ESXi is integrated on PowerEdge systems through embedded Secure Digital (SD) or Universal Serial Bus (USB) cards. Integrated virtualization by VMware offers:

- Ease of deployment
- Integrated hardware monitoring
- Enhanced security
- Reduced patch management
- Improved reliability

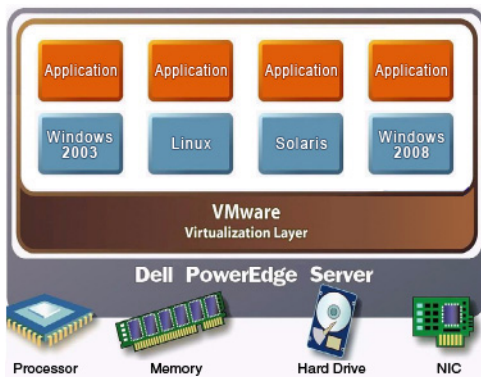


Figure 2. ESXi 5 Architecture

# Getting Started With vSphere 5

- If you have ordered VMware ESXi with your Dell PowerEdge system, ESXi is pre-installed and pre-activated with the Single Server edition license key. Ensure that you note down the license key safely.  
If you have ordered a license plan with your ESXi software, you must register and exchange the Partner Activation Code (PAC) for a product serial number or a license key. You can register the activation codes with either one or multiple license administrators. To activate your product, see the topic "Licensing Information" in this document.
- If you have ordered ESXi separately or through software and peripherals, follow the steps below:
  - a. Download and install the ESXi image.  
See the topic "Installing vSphere 5" in this document.
  - b. Register your product.  
See the topic "Licensing Information" in this document.

## Related Information



**NOTE:** For Dell VMware documentation and Dell systems management documentation for VMware, see [support.dell.com/manuals](http://support.dell.com/manuals). Navigate to **Software** → **Virtualization Solutions** → **VMware Software**.

- For a complete list of Dell supported systems and storage, see *VMware vSphere 5 on Dell PowerEdge and Storage Systems Compatibility Matrix* at [support.dell.com/manuals](http://support.dell.com/manuals).
- For known issues, see *VMware vSphere 5 on Dell PowerEdge Systems Release Notes* at [support.dell.com/manuals](http://support.dell.com/manuals).
- For information on Configuration Maximums, see **Configuration Maximums for VMware vSphere 5** at [vmware.com/support/pubs](http://vmware.com/support/pubs).
- To ensure processor compatibility across systems for VMotion, see the *VMware VMotion and 64-Bit Virtual Machine support for Dell PowerEdge Systems Compatibility Matrix* at [support.dell.com/manuals](http://support.dell.com/manuals).
- For VMware vSphere 5 documents, technical resources, and knowledge base articles, see [vmware.com/support](http://vmware.com/support).
- For *Hardware Compatibility Guides*, see [vmware.com/resources/compatibility/search.php](http://vmware.com/resources/compatibility/search.php).
- For information on ESXi, other Dell VMware products, technical publications including white papers, articles, and case studies, see [dell.com/vmware](http://dell.com/vmware).

## Technical Support Resources

- [vmware.com/support](http://vmware.com/support)
- [dell.com/support](http://dell.com/support)
- [dell.com/services](http://dell.com/services) for Dell deployment and professional services

## Discussion Forums

- [vmware.com/communities/content](http://vmware.com/communities/content)
- [dellcommunity.com](http://dellcommunity.com)

## Knowledge Base

[vmware.com/support/kb](http://vmware.com/support/kb)

## Dell Wiki

[vmware.com/support/kb](http://vmware.com/support/kb)

## Contacting Dell






**NOTE:** If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

1. Visit **support.dell.com**.
2. Select your support category.
3. If you are not a U.S. customer, select your country code at the bottom of the page, or select **All** to see more choices.
4. Select the appropriate service or support link based on your need.



# Installing vSphere 5

-  **NOTE:** If you had ordered VMware ESXi, it is pre-installed on your PowerEdge system. The ESXi installer media is required only for the recovery of a corrupted image.
-  **NOTE:** If you did not order ESXi with your system, you can order the Internal Dual SD Module kit (for PowerEdge R810, R815, R715, and R910 systems only) at [dell.com](http://dell.com) and download the ESXi installation media from [support.dell.com](http://support.dell.com). For information on how to install and setup ESXi, see the topic “Installing, Enabling, and Disabling ESXi”.
-  **NOTE:** vSphere 5 includes the ESXi architecture only.

## Creating The ESXi Installer Media


You can download the Dell-customized ESXi installer image from [support.dell.com](http://support.dell.com). Follow the steps below to create the ESXi installer media:


1. Go to [support.dell.com](http://support.dell.com).
2. Select your line of business.
3. Select **Drivers & Downloads**.
4. Select **Enter a Tag**.
5. Enter the Service Tag of the system you want to install ESXi on and select **Go**.  
Alternatively, you can select **Choose a Model** → **Servers, Storage, Networking** → **PowerEdge Server**. Select the model of your system and confirm your selection.  
The **Drivers & Downloads** page is displayed.
6. Choose the **Operating System** as **ESXi**.
7. Expand **Enterprise Solutions**.
8. Select **Download Now** beside the appropriate image.
9. Use a blank media to burn the ISO image.

You have now created your ESXi installer media.


## Important Information For The Dell-Customized ESXi Image


- The Dell-customized ESXi installer ISO image content does not include Dell OpenManage Server Administrator. For detailed instructions to install and use Dell OpenManage Server Administrator, see the Dell OpenManage documentation at [support.dell.com/manuals](http://support.dell.com/manuals). Select **Software** → **Systems Management**.
- The files that Dell creates or modifies as part of customization are:
  - **etc/vmware/oem.xml**
  - **etc/vmware/support**
  - **etc/vmware/vmware.lic**


-  **NOTE:** The list of files appended, modified or customized by Dell may change during a later release.


-  **NOTE:** Dell-customized ESXi image may contain additional or VMware-IOVP certified updated drivers. For more information, see the topic "Additional Information" of the Drivers release page at [support.dell.com](http://support.dell.com).
- If needed, Dell may update the customized ISO for a critical patch impacting Dell to include VMware patches or bug fixes for Dell hardware.
  - Dell VIB (Dell OpenManage offline bundle) can be installed on ESXi systems using either the ESXi installation media from VMware or the Dell-customized ESXi installation media.

## Installing, Enabling, and Disabling ESXi

 **WARNING:** Any installation that requires removal of the system cover is intended solely to be performed by trained service technicians. See the safety document that is shipped with your system for complete information about safety precautions, working inside the system, and protecting against electrostatic discharge.


 **NOTE:** For important regulatory information, see [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance). **NOTE:** If you have ordered the ESXi kit separately and your PowerEdge system is not pre-installed with the software, you must follow the steps in this section to install ESXi.


 **NOTE:** If you did not order ESXi with your system, you can order the Internal Dual SD Module kit at [dell.com](http://dell.com) and download the ESXi Installation media from [support.dell.com](http://support.dell.com). For information on creating your ESXi media, see the topic "Creating the ESXi Installer Media".

 **NOTE:** If you have ordered the ESXi kit separately and your PowerEdge system is not pre-installed with the software, you must follow the steps in this section to install ESXi.

## USB Key or SD Memory Card Memory Installation

For instructions to install the internal USB key in the supported PowerEdge 1950III, 2900III, and 2950III systems, see the system-specific *Information Update* document at [support.dell.com/manuals](http://support.dell.com/manuals).

 **NOTE:** For more information about supported configurations of PowerEdge systems with the USB key or the SD memory card, see the *VMware vSphere 5 on Dell PowerEdge and Storage Systems Compatibility Matrix* at [support.dell.com/manuals](http://support.dell.com/manuals).


 **NOTE:** For instructions to install the internal USB key or the SD memory card on the system board for other supported PowerEdge systems, see the system-specific Owner's Manual at [support.dell.com/manuals](http://support.dell.com/manuals).

## Installing ESXi On Flash Media

After installing the USB key or SD card in your system, locate the ESXi installer media that you had created in the topic "Creating the ESXi Installer Media".

Follow the steps below to install ESXi on the flash media:

1. Turn on the system.

 **NOTE:** Before installing ESXi, you must enable the flash storage device. For more information, see the topic "Enabling or Disabling Flash Storage Device".

2. Insert the ESXi installer media into the optical drive.
3. Reboot the system.
4. When the DELL logo is displayed, press <F11> immediately.
5. At the **Boot Menu**, use the up and down-arrow keys to select the optical drive and press <Enter>.

The installer environment starts. When the installer image loads, the system is ready to begin the flash storage imaging process.

6. On the **Select a Disk** page, select the USB or SD storage device on which you want to install ESXi and press <Enter>.



**CAUTION: Step 6 erases all data on your USB or SD storage device.**

7. Enter the root password and press <F11> to start the installation.
8. When the installation process is complete, press <Enter> to reboot the system.
9. When the DELL logo is displayed, press <F11> immediately.
10. At the **Boot Menu**, use the up- and down- arrow keys to select the internal USB or SD storage device, and then press <Enter>.  
The system boots and launches ESXi.
11. To enable recurring boot, see the topic "Configuring Recurring Boot to ESXi" .
12. Set the correct licensing mode.  
For more information, see the topic "Licensing Information" .

## Installing ESXi On The Hard Drive

Follow the steps below to install ESXi on the hard drive.

1. Turn on the system.
2. Insert the ESXi installer media that you created earlier.  
See the topic "Creating the ESXi Installer Media" into the optical drive.
3. When the DELL logo is displayed, press <F11> immediately.
4. At the **Boot Menu**, use the up and down-arrow keys to select the optical drive and press <Enter>.  
When the installer image loads, the system is ready to begin the installation process.
5. On the **Select a Disk** page, select the hard drive on which you want to install ESXi and press <Enter>
6. Enter the root password and press <Enter> to reboot the system.
7. When the installation process is complete, press <Enter> to reboot the system.  
The system reboots and launches ESXi.
8. Set the correct licensing mode.  
For more information, see the topic "Licensing Information".

## Enabling Or Disabling Flash Storage Device

ESXi installs on an internal flash storage device.



**CAUTION: Before you begin using the trial version of ESXi, you must enable the internal flash device port. Disable the internal flash storage device when booting to another operating system to avoid loss of data.**



**NOTE:** After the internal flash device port is enabled, you can configure the system to boot ESXi only when specified (one-time boot) or all the time (recurring boot).

1. Turn on the system.
2. When the DELL logo is displayed, press <F2> immediately to enter the **System Setup** screen.



**NOTE:** If you hold down a key on the keyboard for extended periods of time, it may result in keyboard failure. To avoid possible keyboard failure, press and release <F2> in even intervals until the **System Setup** screen is displayed.

If the operating system logo is displayed instead of the **System Setup** screen, wait until the operating system finishes loading. Turn off the system and try again.

3. Use the up- and down-arrow keys to highlight **Integrated Devices**, and then press <Enter> .
4. To *enable* the Flash Storage device:
  - a) Highlight **SD Card** or **Internal USB Port**, depending upon which device is valid for your system.
  - b) Use the right- and left-arrow keys to enable the device.
 To *disable* the Flash Storage device:
  - a) Restart ESXi and access **System Setup**.
  - b) Select **SD Card** or **Internal USB Port**, depending upon which device is valid for your system.
  - c) Use the right- and left-arrow keys to disable the device.



**CAUTION:** Booting into an operating system other than ESXi without disabling the flash media results in data loss.

5. Press <Enter> to save your selection.
6. Press <Esc>.
7. Select **Save Changes and Exit**.
8. Press <Enter> to exit the **System Setup** screen.
9. Reboot the system.
10. To complete the process, follow the steps in the topic "Configuring One-Time Boot to ESXi" or "Configuring Recurring Boot to ESXi".


## Configuring One-Time Boot To ESXi

1. Turn on your system.  
The DELL logo is displayed.
2. Press <F11> to enter the one-time boot menu option.  
The menu entry changes to **Entering Boot Menu**, confirming your selection.
3. The boot menu displays several boot options. Using the up- and down-arrow keys, select **Hard Drive C:**, then use the right-arrow key to select **SD Card** or **Internal USB Port**.
4. Press <Enter> to boot to the internal secure digital (SD) card or USB port.

## Configuring Recurring Boot To ESXi


Follow the steps given below to boot your system to ESXi. Once the internal flash device port is enabled, your system continues to boot to ESXi.


1. Turn on your system.  
The DELL logo is displayed.
2. Press <F2> to launch the **Setup** menu.  
After you complete the system boot, the system BIOS configuration menu is displayed.
3. Using the up- and down-arrow keys, select **Hard Disk Boot Sequence** and then select **SD Card: Multi Card**. Press the hyphen key <-> to move the SD card or internal USB port up in the order.
4. Press <Enter>, <Esc>, and then <Enter> to save these changes.

 **CAUTION:** It is recommended that you do not modify other settings unless you are familiar with the settings. Modifying settings could cause your system to fail to boot or function properly.

5. Restart your system.


## Downloading The Patches And Updates For ESXi

 **NOTE:** Ensure that you follow the instructions given in this section to install any patches or updates for ESXi.

 **NOTE:** Check for the latest patch and update releases for your ESXi version regularly. After you install ESXi, check for the latest patches or updates. For some hardware configurations, VMware may list certain patches or updates as required on its hardware compatibility list at [vmware.com/resources/compatibility/search.php](http://vmware.com/resources/compatibility/search.php).

To check for and install the latest ESX or ESXi patch:

1. Go to [support.vmware.com/selfsupport/download](http://support.vmware.com/selfsupport/download).
2. Select **ESXi (Embedded and Installable)** from the product drop-down menu.
3. Select the version of your software from the version drop-down menu.
4. Enter the **Release Date** of the patch or select the **Release Date** by clicking the calendar icon.
5. Select **All Classifications** from the classifications drop-down menu.
6. Select **Search**.  
The **Download Patches** page displays a list of all the patches that match the details you specified.
7. Select the required patch and click **Download Now** to download the zip file.
8. Install the patch using any of the update tools provided by VMware such as **esxcli** or **vCenter Update Manager**.


 **NOTE:** For more information on patch management, see [vmware.com/support/pubs/](http://vmware.com/support/pubs/).

## Creating The vCenter Server Installation Media


1. Go to [vmware.com/download](http://vmware.com/download).
2. Select the **VMware vSphere 5** download link.
3. Use your VMware store account credentials to log in to the download portal.
4. Follow the on-screen instructions to download the vCenter Server software.
5. Use a blank media to burn the ISO image.

You have now created your vCenter Server installation media.

## Installing vCenter Server


 **NOTE:** You must install and use vCenter Server to centrally manage your vSphere environment and to make use of all the features of vSphere Essentials Plus, Standard, Enterprise, or Enterprise Plus edition.

1. Insert the vCenter Server media into the optical drive.
2. Follow the on-screen instructions.


 **NOTE:** If the installation program does not start automatically, browse to the vCenter Server media directory and locate **autorun.exe**. Double-click **autorun.exe** and follow the on-screen instructions.

## Installing vSphere Client

1. Point the web browser of your Windows management system to the IP address of your ESXi server host to download vSphere Client.  
The IP address of your system is displayed on the main screen of your system. The browser displays a webpage.
2. Click on the **Download VMware vSphere Client** link and install the client software.

 **NOTE:** Ensure that the system is connected to the Internet.

3. After the download is complete, launch the VMware vSphere Client by completing the tasks below.
  - a) Specify the IP address of your ESXi Server host.
  - b) Specify a username of root (default).
  - c) Provide the password you specified in the topic "Configuring the Password".

 **NOTE:** If you did not specify a password, leave the password field blank.

You receive a warning that the SSL certificate is not trusted and communication cannot be secured. You receive this notification because your host does not have a public key from VMware.

4. Click **Ignore** to proceed. To ignore this warning always, select the **Always Ignore** check box.

## Troubleshooting ESXi Installation

This section provides troubleshooting steps for common issues encountered during deployment of ESXi.

### ESXi Not Booting or Displays a "No OS found" Message at Start Up


Check the boot order. The correct storage device may no longer be selected as the first boot device. This can happen if the device has recently been removed due to failure. To correct this issue, ensure that the internal storage drive on which ESXi is installed is assigned as the first boot device in the hard drive sequence and the hard drive is assigned as the first boot device in the boot sequence.

### Purple or Pink Screen While Booting or Running Your ESXi

This is a sign of a serious misconfiguration or system error, similar to a blue screen of death for a Windows operating system or a core dump for a Linux-based system. Contact Dell Support for technical assistance. See the topic "Contacting Dell".

## Deploying vSphere 5 — Important Information


- VMware vSphere 5 introduces vRAM pool licensing limits, based on product family per socket: 24 GB for Standard, 32 GB for Enterprise, 48 GB for Enterprise Plus, and a total of 144 GB for Essentials Plus. vRAM is the total virtual RAM allocated to an active virtual machine. For example, a virtual machine with 4 GB of virtual RAM would take up 4 GB of vRAM from the licensing allowance. vRAM is pooled at the vCenter level by product family and can be used by any server using that product family licensing in the cluster.
- Dell PowerEdge systems shipped with BCM 5709 LOMs (with iSCSI offload enabled through the hardware key) support iSCSI Boot Firmware Table (iBFT).
- PowerEdge systems shipped with Intel Xeon 5600 series processor support Intel Trusted Execution Technology (TXT) with the latest shipping BIOS.
- While installing VMware ESXi on a PowerEdge system, ensure that vFlash is disabled. When vFlash is enabled, iDRAC may expose different USB partitions which may result in an installation failure.
- You cannot automatically pre-activate the Microsoft Windows Server 2008 operating system installed on virtual machines by using the product activation code in the Dell OEM installation media. You must use a virtual product key to activate the guest operating system. For more information, see the whitepaper, *Dell OEM Windows Server 2008 Installation on Virtual Machines Using Dell OEM Media* at [dell.com](http://dell.com).
- The ESXi image pre-installed on your PowerEdge system may not contain all the drivers required for peripherals. Additional drivers need to be installed to enable certain add-on peripherals. You can download the drivers from [support.dell.com](http://support.dell.com).
- Storage logical unit numbers (LUNs) (on local system) are supported only with PERC/CERC/SAS-hardware-based RAID configurations.
- If you did not order ESXi with your system, you can order the Internal Dual SD Module kit (for PowerEdge R810, R815, R715, and R910 systems only) at [dell.com](http://dell.com) and download the ESXi installation media from [support.dell.com](http://support.dell.com).
- ESXi installation using the DRAC/iDRAC virtual media is supported. You must use Dell-customized ESXi images from [support.dell.com](http://support.dell.com).
- On Non-Uniform Memory Access (NUMA) enabled systems installed with ESXi, it is recommended that you populate all processor nodes with similar memory to enable balanced distribution of memory across nodes. With unbalanced memory distribution across nodes, you may face performance degradation issues or ESXi may fail to boot.

 **NOTE:** For more information about NUMA, see VMware knowledge base articles: [kb.vmware.com/kb/1003690](http://kb.vmware.com/kb/1003690) and [kb.vmware.com/kb/1570](http://kb.vmware.com/kb/1570). Also, see *VMware's Resource Management Guide* for vSphere 4 at [vmware.com/support/pubs/](http://vmware.com/support/pubs/).

- ESXi requires a minimum system memory of 3 GB on all supported systems.

## Best Practices Checklist for Deploying ESXi

1. Rack and connect your PowerEdge system.
2. Turn off your system.
3. Connect your ESXi management network to the first onboard network adapter.
4. Connect your virtual machine network to the second onboard network adapter.
5. Optionally, connect your iSCSI-based network connection to the third onboard network adapter (if applicable).

 **NOTE:** For systems with only two onboard network adapters, it is recommended that you add a supported network adapter.

6. Turn on your system.

7. To enter the system setup, press <F> when you turn on the system. For more information, see the documentation that ships with your system.
8. Enable the Virtualization Technology (VT) feature, if available, in the PowerEdge system.



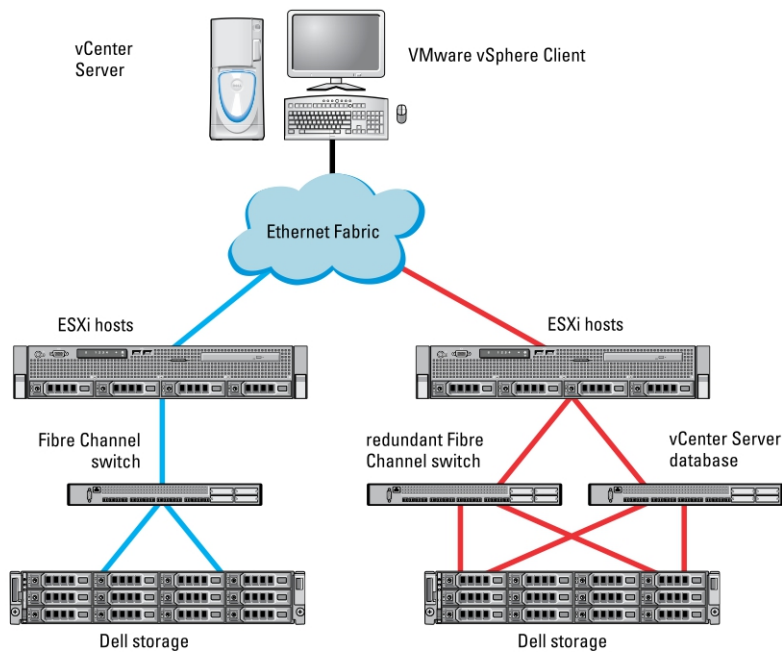
**NOTE:** The VT feature is required to run 64-bit virtual machines.

9. Set the universal serial bus (USB) controller to **USB on with BIOS Support**, if available, in the PowerEdge system. This setting enables support for USB devices both during and after the ESXi boot process.
10. Set the ESXi keyboard language.
11. Set the ESXi password.  
For more information, see the topic "Configuring the Password".
12. Set a static IP address, subnet mask, gateway, and VLAN for the management connection(s) in the Direct Console User Interface (DCUI).
13. Set host name and Domain Name System (DNS) settings.
14. Set DNS suffix(s).
15. Install vSphere Client to manage your system.
16. Replace the Single Server Edition license key with the license key that you have purchased.

## vSphere Configuration Using Dell Fibre Channel SAN

**Figure Configuring vSphere Using Dell Fibre Channel SAN** shows the vSphere configuration using Fibre Channel SAN. If you use Fibre Channel storage, you can connect a single Fibre Channel Host Bus Adapter (HBA) to a Fibre Channel switch that provides paths to both the storage processors (SPs) on the Fibre Channel storage unit. To provide maximum protection against a single failure at the HBA, Fibre Channel switch, or SP level, it is recommended that you use two Fibre Channel HBAs on the ESXi host connected to separate Fibre Channel switches. The Fibre Channel switches provide redundant paths to the SPs on the storage unit.



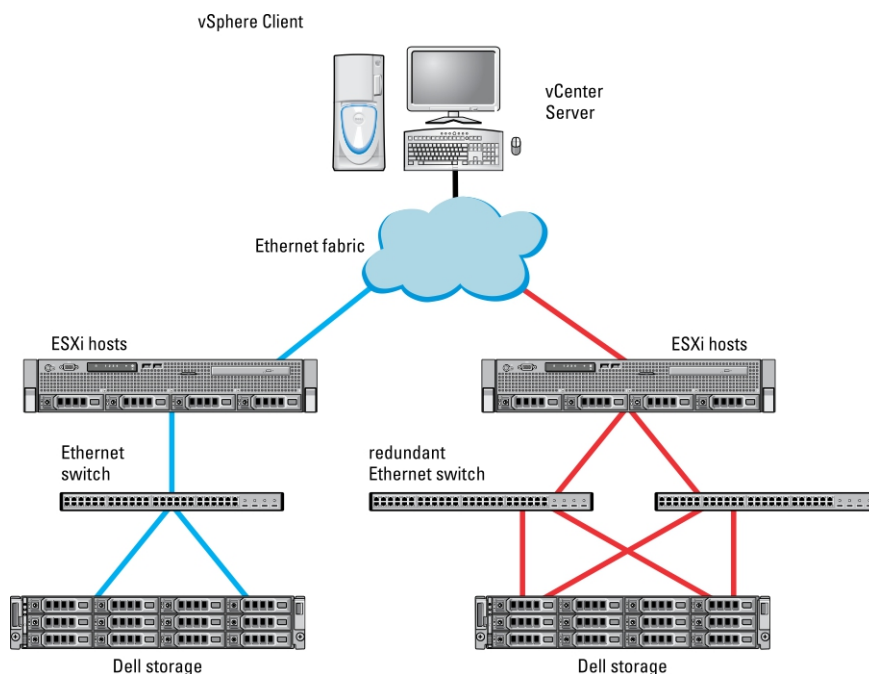


**Figure 3. Configuring vSphere Using Dell Fibre Channel SAN**

## vSphere Configuration Using iSCSI SAN

The figure, “Configuring vSphere With iSCSI SAN” shows a vSphere configuration using iSCSI SAN. The iSCSI SAN provides a cost-effective solution. It is recommended to use two iSCSI initiators on the ESXi host connected to two separate ethernet switches to provide redundant paths to the storage processors on the storage system.

**NOTE:** For more information on Dell-supported storage arrays on VMware, see *VMware vSphere 5 on Dell PowerEdge and Storage Systems Compatibility Matrix* at [support.dell.com/manuals](http://support.dell.com/manuals).



**Figure 4. Configuring vSphere With iSCSI SAN**

## Booting ESXi

This section describes how to perform the basic setup of your system based on the following assumptions:

- You have already connected a keyboard, monitor, and mouse.
- You have connected the first onboard NIC to your management network.
- Ensure that the infrastructure between the two systems is working correctly prior to working with your system and the VMware management software.

To set up your system:

1. Turn on your system.
2. Press <F11> at boot and select the internal storage device as the one-time boot device located under Hard Drives in the menu.




**NOTE:** If you ordered ESXi as the primary operating system, the boot order of the system is already set to boot from ESXi.



**NOTE:** If you ordered ESXi as an included hypervisor, with zero years of technical support service and did not request a hard-disk based operating system, your system may boot to a **No Operating System Found** message. Set the system boot order to make the storage device containing ESXi (USB or SD card) as the first boot device.

In the first phase of booting, the compressed ESXi modules are loaded into memory and a progress bar is displayed. In the second phase, the modules are expanded and executed from memory. As the modules load, the DCUI briefly displays the module names on the screen.

After all ESXi modules have expanded and executed, the system is ready to begin servicing workloads as illustrated in Figure 4-3. If there is a Dynamic Host Configuration Protocol (DHCP) system or DHCP proxy configured on your network subnet, ESXi displays the address acquired by the DHCP system.

 **NOTE:** When the address is being acquired, 0.0.0.0 is displayed by default.

To install vSphere Client, see "Installing vSphere Client". If a warning is displayed, the ESXi host was unable to obtain an IP address from your DHCP system. For information on configuring the setting, see "Configuring, Restarting, Testing, or Restoring the Management Network Services".

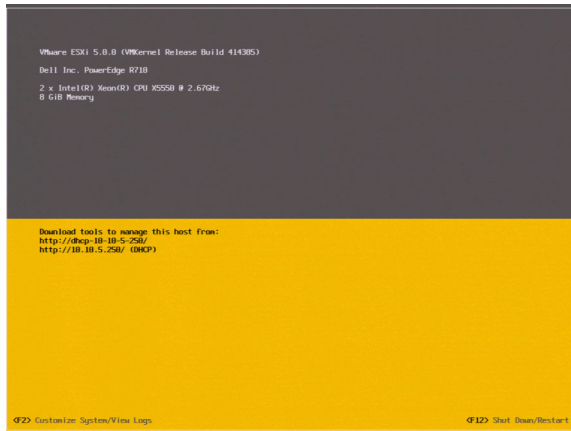


Figure 5. ESXi (Running With DHCP)



Figure 6. ESXi (Running With DHCP and No Address)

## Configuring The Password

You can use DCUI to change the password for the administrator account. The administrative user name for the ESXi 5 host is `root`.

.

To change the password:

1. Press <F2> in the main ESXi Server host screen that is displayed after your system boots. The **Authentication Required** screen is displayed.
2. Select **Configure Password** and then press <Enter>.
3. Enter the old and new passwords.  
If the password is accepted, the main DCUI screen is displayed. The new password is now set.

4. Press <Esc> to logout.

## Configuring Lockdown Mode

Lockdown mode prevents remote personnel from logging in to the ESXi host by using the root login name. By default, lockdown mode is disabled. If you enable lockdown mode and do not configure other local host user accounts to have standalone host access through the vSphere Client, the root user does not have access through the vSphere API and CLI.

You can still access the host through the direct console or through an authorized, centralized management application, such as vCenter Server.

1. Select **Configure Lockdown Mode** and press <Enter>.
2. Press the <spacebar> to select **Enable Lockdown Mode** and press <Enter>.
3. Press <Enter>.

## Managing the Management Network Services

The ESXi 5 kernel supports IPv4, IPv6, and IEEE 802.1Q (VLAN tagging) for all management network connections. Configuration of parameters including IP address, gateway, subnet mask, host name, and DNS systems occurs through the DCUI. All virtual machine network configuration is performed from the VMware management software. Virtual machine networks configurations from the DCUI is not supported.

1. Press <F2> in the main ESXi host screen that is displayed after your system boots.  
The **Authentication Required** screen is displayed.
2. Press <Enter> twice.  
The main DCUI configuration screen is displayed.
3. Select **Configure Management Network** in the main DCUI customization screen, and press <Enter>.  
The **Management network configuration** screen is displayed.
4. For the PowerEdge M-series modular systems enabled with FlexAddress:
  - a) Ensure that the variable **Net.FollowHardwareMac** is set to **1**.
  - b) Use the vSphere Client to connect to the ESXi host.
  - c) Navigate to **Configuration** → **Software** → **Advanced Settings** → **Net**.
  - d) Set **Net.FollowHardwareMac** to **1** and reboot the ESXi host.
5. Backup your configuration settings using the procedures in the topic "Configuration Backup and Restore Procedures"
6. Record your license key.

# Configuration Backup and Restore Procedures

It is recommended that you back up your VMware ESXi configuration after you complete the initial setup on a routine schedule that fits your datacenter environment. Backing up your configuration captures the license code (host serial number). You need the license code if you use the installer media to restore the ESXi image.

To backup or restore the configuration information, you must use the VMware vSphere CLI. The vSphere CLI is available in:

- vSphere CLI package—vSphere CLI package can be installed on either Linux or on Microsoft Windows operating systems.
- vSphere Management Assistant (vMA)—vMA can be deployed on an ESXi host.

Both of these packages are available for download from [vmware.com](http://vmware.com). For information about setting up and running the vSphere CLI, see the *VMware vSphere Command-Line Interface Installation and Reference Guide* and *VMware ESXi Embedded and vCenter Server Setup Guide* at [vmware.com/support/pubs](http://vmware.com/support/pubs).

The backup and restore steps given in this section assume that:

- You have already imported the vSphere CLI to a system other than the one you want to backup or restore.
- You have installed the Windows or Linux management Application Programming Interfaces (APIs).


## Backing Up The Configuration Of Your ESXi Host


To back up configuration data of a host:

1. Start the vSphere CLI.
2. Run the `vicfg-cfgbackup` command with the `-s` flag to save the host configuration to the specified backup filename.

```
vicfg-cfgbackup --server< ESXi-host-ip> -- portnumber <port_number> --
protocol <protocol_type> --username root --password root_password [-s
<backup-filename>]
```

The `-portnumber` and `-protocol` options are optional. If you exclude them, the defaults are port **443** and protocol **HTTPS**.

 **NOTE:** If you do not specify a password in the command line, you are prompted for one when the command executes. For example: `vicfgcfgbackup --server 172.17.13.211 --username root -s backupdate.dat`

 **NOTE:** If your administrative password includes special characters, such as \$ or &, you must include a backslash escape character (\) before each special character.

## Restoring The Configuration Of Your ESXi Host

To restore the configuration data of a host:

1. Turn off any virtual machines that are running on the host you want to restore.
2. Optionally, restore the host to the ESXi build number used when the backup file was created.

The backup process does not support restoring to later builds. This requirement can be overridden by using the **-f** option.

3. Start the vSphere CLI on a host other than the host you want to restore and log in.

4. Run the `vicfg-cfgbackup` command with the **-l** flag to load and restore the backup file to the host.

```
vicfg-cfgbackup --server <ESXi-host-IP> -- portnumber <port_number> --  
protocol <protocol_type>-- username <username> --password <password> -l  
<backup_filename>
```

The **-portnumber** and **-protocol** options are optional. If you exclude them, the defaults are **port 443** and protocol **HTTPS**.



**NOTE:** If you do not specify a password in the command line, you are prompted for one when the command executes. For example:

```
vicfgcfgbackup --server 172.17.13.211 --username root -l backupdate.dat
```

After a successful restore, the system reboots using the new configuration. For complete instructions on backup and restore commands, see the *VMware ESXi Embedded and vCenter Server Setup Guide* at [vmware.com/support/pubs](http://vmware.com/support/pubs).

## Image Recovery

The procedure described in this section restores your system to a bootable state, but does not restore the per-system licensing activation information. If you have a valid support subscription, Dell Support can help you with the re-imaging process and with any licensing issues. To contact Dell Support, see "Contacting Dell".

If you require a new license from Dell Support, but need to have the system up and running as soon as possible, you may use the one-time 60-day trial of all enterprise-level features including HA, DRS, and vCenter Server. It is recommended to request the new license as soon as possible following an image recovery to ensure you have your new license before the 60-day trial period expires. This process takes less than 60 days.

### Image Recovery For ESXi Embedded Edition

Image recovery reinstalls or recovers the ESXi embedded image. To perform image recovery for flash-based systems:

1. Download the Dell customized ESXi ISO image from [support.dell.com](http://support.dell.com).
2. Burn the ISO image to an optical media.
3. Turn on the system and press <F11> (one-time boot menu) during the POST.  
The system displays `Entering Boot Menu...` in the upper right corner of the screen. Continue with the POST process. After the initial boot is complete, a text menu of all bootable storage devices is displayed.
4. Select the optical drive where your installer media is located. For internal optical drives, select the device and press <Enter>.  
The recovery environment starts.
5. Follow the on-screen instructions to complete the recovery process.



**NOTE:** If you see a fatal error, double check that no other USB-based storage devices are connected to the system.

The system reboots and launches ESXi. If this does not happen, reassign the order of your boot devices placing the internal storage highest in the boot order list. For more information, see the manual that shipped with your system.

6. Set the correct licensing mode.
7. After reimaging, reconfigure ESXi and import any virtual machines you would like to run on this system.

# Licensing Information

This section discusses the different modes of obtaining license for your Dell PowerEdge system.



**NOTE:** For more information about the different editions, see [vmware.com](http://vmware.com).

## License Evaluation

VMware allows a 60-day free evaluation period for all enterprise-level features of vSphere 5. At the end of the evaluation period, your ESXi hypervisor may stop managing all virtual machines in the inventory. To continue managing the virtual machines, upgrade the evaluation license to either the ESXi Single Server Edition license or the vSphere Essentials Plus, Standard, Enterprise, or Enterprise Plus edition license that you purchased.

## ESXi Single Server Edition Licensing

The ESXi ordered with your system is pre-installed and activated with the ESXi Single Server edition license key. Note down the license key and store it safely. To retrieve the license key:

1. Log in to the **Direct Console User Interface (DCUI)**.
2. Go to **View Support Information** and note down the displayed license key.  
Alternatively, connect to the ESXi system using vSphere Client. Go to **Configuration** → **Software** → **Licensed Features** and record the displayed license key.



**NOTE:** The ESXi ordered with your system is pre-installed and activated with the ESXi Single Server edition license. If you ordered the ESXi hypervisor-based vSphere Essentials Plus, Standard, Enterprise, or Enterprise Plus edition, replace the pre-installed ESXi Single Server edition license key with the vSphere Essentials Plus, Standard, Advanced, Enterprise, or Enterprise Plus edition license key.



**NOTE:** You can choose to evaluate the enterprise-level features during the first 60-day free evaluation period. At the end of the 60-day evaluation period, reassign the recorded ESXi Single Server edition license key to enable your system to function in that mode.




## vSphere Essentials Plus, Standard, Enterprise, Enterprise Plus Edition, and vCenter Server Licensing

If you ordered the vSphere Essentials Plus, Standard, Enterprise, Enterprise Plus edition, or vCenter Server, the license certificate is shipped. To use the software and receive the subscription services, you must register and exchange the partner activation code printed on the license certificate for a license key or license activation code. The registration must be completed within 30 days from the date of product purchase.

For information about product features and licensing methods, see [vmware.com](http://vmware.com). Administer the license key to your ESXi host using vSphere Client or vCenter Server.

# Administering License Keys


You can administer the license key using vSphere Client to manage the licenses individually on the ESXi system. Alternatively, you can use vCenter Server to manage the licenses centrally.

-  **NOTE:** For more information on administering license keys and VMware software licensing configuration, see [vmware.com/support/pubs](https://www.vmware.com/support/pubs).
-  **NOTE:** If you receive a warning that you are disabling certain features by switching out of evaluation mode, click **OK**, and then click **Yes**.
-  **NOTE:** You must use all licensing information according to VMware's End User Licensing Agreement.



# Supported PowerEdge Configurations for vSphere 5

For complete information about all the supported Dell PowerEdge systems with VMware ESXi, see *VMware vSphere 5 on Dell PowerEdge and Storage Systems Compatibility Matrix* at [support.dell.com/manuals](http://support.dell.com/manuals).

 **NOTE:** The SAS/SATA drives mentioned in the following tables also include Dell PCIe SSD drives.

The following lists the currently shipping PowerEdge systems that support ESXi 5.0.

## PowerEdge M915 Configuration

PowerEdge M915	
Processor	AMD Opteron 6100/6200 series
Minimum Memory	4 GB
Internal Storage	Two 2.5" SAS/SATA disks
Internal Storage Adapter	PowerEdge RAID Controller (PERC) H200 Integrated and PERC H700 Integrated
External Disks Storage Adapter	Not applicable
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	Integrated Dell Remote Access Controller (iDRAC) 6

## PowerEdge M910 Configuration

PowerEdge M910	
Processor	Intel Xeon 6500 series or Intel Xeon 7500 series or Intel Xeon E7- 2800/4800/8800 product family
Minimum Memory	4 GB
Internal Storage	Two 2.5" SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H200 Modular and PERC H700 Modular
External Disks Storage Adapter	Not applicable
Fibre Channel HBA (SAN connectivity)	All supported daughter cards

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**PowerEdge M910**

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Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC 6

## PowerEdge M710HD Configuration

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**PowerEdge M710HD**

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Processor	Intel Xeon 5500/5600 series
Minimum Memory	4 GB
Internal Storage	Two 2.5" SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H200 Embedded
External Disks Storage Adapter	Not applicable
Fibre Channel HBA (SAN connectivity)	All supported daughter cards
Networking	Four integrated network ports and all supported peripheral NIC daughter cards
Remote Access	iDRAC 6

## PowerEdge M710 Configuration

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**PowerEdge M710**

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Processor	Intel Xeon 5500/5600 series
Minimum Memory	4 GB
Internal Storage	Up to two 2.5" SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	SAS 6/iR Integrated, CERC 6/i, PERC 6/i Integrated, PERC H200 Modular, and PERC H700 Modular
External Disks Storage Adapter	Not applicable
Fibre Channel HBA (SAN connectivity)	All supported daughter cards
Networking	Four integrated network ports and all supported peripheral NIC daughter cards
Remote Access	iDRAC 6

## PowerEdge M610x Configuration

PowerEdge M610x	
Processor	Intel Xeon 5500/5600 series
Minimum Memory	4 GB
Internal Storage	Two 2.5" SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H200 Modular and PERC H700 Modular
External Disks Storage Adapter	PERC H800
Fibre Channel HBA (SAN connectivity)	All supported daughter cards
Networking	Four integrated network ports and all supported peripheral NIC daughter cards
Remote Access	iDRAC6

## PowerEdge M610 Configuration

PowerEdge M610	
Processor	Intel Xeon 5500/5600 series
Minimum Memory	4 GB
Internal Storage	Two 2.5" SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	SAS 6/iR Integrated, CERC 6/i, PERC 6/i Integrated, PERC H200 Modular, and PERC H700 Modular
External Disks Storage Adapter	Not Applicable
Fibre Channel HBA (SAN connectivity)	All supported daughter cards
Networking	Two integrated network ports and all supported peripheral NIC daughter cards
Remote Access	iDRAC6

## PowerEdge R910 Configuration

PowerEdge R910	
Processor	Intel Xeon 7500 series or Intel Xeon E7- 4800/8800 product family
Minimum Memory	4 GB
Internal Storage	Up to sixteen 2.5" SAS/SATA disks

---

**PowerEdge R910**

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Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	SAS 6/iR Integrated, PERC 6/i Integrated, PERC H200 Integrated, and PERC H700 Integrated
External Disks Storage Adapter	SAS 5/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

## PowerEdge R815 Configuration

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**PowerEdge R815**

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Processor	AMD Opteron 6100/6200 series
Minimum Memory	8 GB
Internal Storage	Up to six 2.5" SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H200 Integrated and PERC H700 Integrated
External Disks Storage Adapter	SAS 5/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Up to four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

## PowerEdge R810 Configuration

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**PowerEdge R810**

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Processor	Intel Xeon 6500 series or Intel Xeon 7500 series or Intel Xeon E7- 2800/4800/8800 product family
Minimum Memory	4 GB
Internal Storage	Up to six 2.5" SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H200 Integrated and PERC H700 Integrated
External Disks Storage Adapter	SAS 5/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs

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**PowerEdge R810**

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Remote Access

iDRAC6 Enterprise

## PowerEdge R715 Configuration

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**PowerEdge R715**

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Processor

AMD Opteron 6100/6200 series

Minimum Memory

8 GB

Internal Storage

Up to six 2.5" SAS/SATA disks

Internal Flash Memory

Supported SD memory card

Internal Storage Adapter

PERC H200 Integrated and PERC H700 Integrated

External Disks Storage Adapter

SAS 5/E, 6 Gbps SAS HBA, and PERC H800

Fibre Channel HBA (SAN connectivity)

All supported HBAs

Networking

Four integrated network ports and all supported peripheral NICs

Remote Access

iDRAC6 Enterprise

## PowerEdge R710 Configuration

---

**PowerEdge R710**

---

Processor

Intel Xeon 5500/5600 series

Minimum Memory

4 GB

Internal Storage

Up to eight 2.5" SAS/SATA or six 3.5" SAS/SATA disks

Internal Flash Memory

Supported SD memory card

Internal Storage Adapter

PERC 6/i Integrated, SAS 6/iR Integrated, PERC H200 Integrated, and PERC H700 Integrated

External Disks Storage Adapter

SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800

Fibre Channel HBA (SAN connectivity)

All supported HBAs

Networking

Four integrated network ports and all supported peripheral NICs

Remote Access

iDRAC6 Enterprise

## PowerEdge R610 Configuration

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**PowerEdge R610**

---

Processor

Intel Xeon 5500/5600 series

Minimum Memory

4 GB

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**PowerEdge R610**

---


Internal Storage	Up to six 2.5" SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	SAS 6/iR Integrated, PERC 6/i Integrated, PERC H200 Integrated, and PERC H700 Integrated
External Disks Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

## PowerEdge R510 Configuration

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**PowerEdge R510**

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Processor	Intel Xeon 5500/5600 series
Minimum Memory	4 GB
Internal Storage	Up to twelve 3.5" SAS/SATA hard drives
Internal Flash Memory	Supported internal USB memory key
Internal Storage Adapter	SAS 6i/R Integrated, PERC 6/i Integrated, PERC H200 Integrated, and PERC H700 Integrated
	 <b>NOTE:</b> The x12 backplanes support only PERC H200 and PERC H700 adapters.
External Disks Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA (SAN connectivity)	Two integrated network ports and all supported peripheral NICs All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

## PowerEdge R515 Configuration

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**PowerEdge R515**

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Processor	AMD Opteron 4100/4200 series
Minimum Memory	4 GB
Internal Storage	Up to twelve 3.5" SAS/SATA hard drives
Internal Flash Memory	Supported internal USB memory key
Internal Storage Adapter	PERC H200 Integrated, and PERC H700 Integrated

---

**PowerEdge R515**

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External Disks Storage Adapter	PERC H800, and 6 Gbps SAS HBA
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

## PowerEdge R415 Configuration

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**PowerEdge R415**

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Processor	AMD Opteron 4100/4200 series
Minimum Memory	4 GB
Internal Storage	Four 3.5" SAS/SATA disks
Internal Storage Adapter	PERC H200 Integrated, and PERC H700 Integrated
External Disks Storage Adapter	PERC H800, and 6 Gbps SAS HBA
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

## PowerEdge R410 Configuration

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**PowerEdge R410**

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Processor	Intel Xeon 5500 /5600 series
Minimum Memory	4 GB
Internal Storage	Four 3.5" SAS/SATA disks
Internal Storage Adapter	SAS 6/iR Integrated, PERC 6/i Integrated, PERC H200 Integrated, and PERC H700 Integrated
External Disks Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

## PowerEdge R310 Configuration

PowerEdge R410	
Processor	Intel Xeon 3400 series or Core i3 series
Minimum Memory	4 GB
Internal Storage	Upto four 3.5" or 2.5" SAS/SATA disks
Internal Storage Adapter	SAS 6/iR Integrated, PERC H200, and PERC H700
External Disks Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS, and PERC H800
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

## PowerEdge R210 II Configuration

PowerEdge R210 II	
Processor	Intel Xeon E3-1200 product family or Core i3 series
Minimum Memory	4 GB
Internal Storage	Two 3.5" SAS/SATA disks
Internal Storage Adapter	PERC H200
External Disks Storage Adapter	PERC H800
Fibre Channel HBA (SAN connectivity)	Not applicable
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

## PowerEdge R210 Configuration

PowerEdge R210	
Processor	Intel Xeon 3400 series or Core i3 series
Minimum Memory	4 GB
Internal Storage	Two 2.5" or 3.5" SAS/SATA disks
Internal Storage Adapter	SAS 6/iR and PERC H200
External Disks Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA (SAN connectivity)	Not applicable



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**PowerEdge R210**

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Networking	One integrated network port and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

## PowerEdge T710 Configuration

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**PowerEdge T710**

---

Processor	Intel Xeon 5500/5600 Series
Minimum Memory	4 GB
Internal Storage	Up to sixteen 2.5" SAS/SATA disks or up to eight 3.5" SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC 6/i Integrated, SAS 6/iR Integrated, PERC H200 Integrated, and PERC H700 Integrated
External Disks Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

## PowerEdge T610 Configuration

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**PowerEdge T610**

---

Processor	Intel Xeon 5500/5600 series
Minimum Memory	4 GB
Internal Storage	Up to eight 2.5" SAS/SATA or 3.5" SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	SAS 6/iR Integrated, PERC 6/i Integrated, PERC H200 Integrated, and PERC H700 Integrated
External Disks Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

## PowerEdge T410 Configuration

PowerEdge T410	
Processor	Intel Xeon 5500/5600 Series
Minimum Memory	4 GB
Internal Storage	Six 3.5" SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC 6/i , SAS 6/iR, PERC H200, and PERC H700
External Disks Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA (SAN connectivity)	Not applicable
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

## PowerEdge T310 Configuration

PowerEdge T310	
Processor	Intel Xeon 3400 series or Core i3 series
Minimum Memory	4 GB
Internal Storage	Four 3.5" SAS/SATA disks
Internal Storage Adapter	SAS 6/iR, PERC 6/i, PERC H200, and PERC H700
External Disks Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA (SAN connectivity)	Not applicable
Networking	One integrated network port and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

## PowerEdge T110 II Configuration

PowerEdge T110 II	
Processor	Intel Xeon E3-1200 product family or Intel Core i3 series
Minimum Memory	4 GB
Internal Storage	Four 3.5" SAS/SATA disks
Internal Storage Adapter	PERC H200
External Disks Storage Adapter	Not applicable
Fibre Channel HBA (SAN connectivity)	Not applicable

<b>PowerEdge T110 II</b>	
Networking	One integrated network port and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

## PowerEdge T110 Configuration

<b>PowerEdge T110</b>	
Processor	Intel Xeon 3400 series or Core i3 series
Minimum Memory	4 GB
Internal Storage	Four 3.5" SAS/SATA disks
Internal Storage Adapter	SAS 6/iR, PERC H200
External Disks Storage Adapter	SAS 5/E, 6 Gbps SAS HBA
Fibre Channel HBA (SAN connectivity)	Not applicable
Networking	One integrated network port and all supported peripheral NICs
Remote Access	Not applicable